AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A biochip, comprising:

a chip substrate;

~~wherein a gel type of spots are integrated~~ gel spots mounted and immobilized on ~~a chip~~ said chip substrate, wherein said gel spots have pores therein; and ~~with~~

biomaterials entrapped in said pores ~~therein~~ of said gel spots and encapsulated by ~~spot~~ said gel spots, and said biomaterials have a free orientation without being immobilized.

2. (Original) The biochip according to claim 1, which is used as protein chips, DNA chip, new drug screening chips, environmental assay chips, toxicity assay chips, or food bacteria assay chips.

3. (Withdrawn) A coating solution for a chip substrate comprising a coating agent selected from the group consisting of polyvinyl acetate (PVAc) having a molecular weight in the range of 800 to 200,000, poly (vinyl butyral-co-vinylalcohol-co-vinyl acetate) having a molecular weight in the range of 70,000 to 120,000, poly (methyl methacrylate-co-methacrylic acid) having a molecular weight of 10,000 or more, poly (methyl vinyl ether-maleic anhydride) having a molecular weight of 200,000 or more, poly (methyl vinyl ether-maleic anhydride) having a molecular weight of 1,000,000 or more, poly (methyl acrylate) having a molecular weight of 10,000 or more, 3-glycidoxypropyltrimethoxysilane (GPTMOS), dissolved in

solvent(s) selected from the group consisting of methylene chloide, tetrahydrofuran, ethanol, methanol, butanol, methyl ethyl ketone, acetone, isopropyl alcohol, ethyl acetate, methyl isobutyl ketone, and di-acetone alcohol.

4. (Withdrawn) The coating solution according to claim 3, wherein the solvent is used in a concentration of 5 to 20 % by weight of the total coating solution.

5. (Currently Amended) A chip substrate coated with ~~the~~a coating solution ~~according to claim 3~~selected from the group consisting of polyvinyl acetate (PVAc) having a molecular weight in the range of 800 to 200,000, poly (vinyl butyral-co-vinylalcohol-co-vinyl acetate) having a molecular weight in the range of 70,000 to 120,000, poly (methyl methacrylate-co-methacrylic acid) having a molecular weight of 10,000 or more, poly (methyl vinyl ether-maleic anhydride) having a molecular weight of 200,000 or more, poly (methyl vinyl ether-maleic anhydride) having a molecular weight of 1,000,000 or more, poly (methyl acrylate) having a molecular weight of 10,000 or more, 3-glycidoxypropyltrimethoxysilane (GPTMOS), dissolved in solvent(s) selected from the group consisting of methylene chloide, tetrahydrofuran, ethanol, methanol, butanol, methyl ethyl ketone, acetone, isopropyl alcohol, ethyl acetate, methyl isobutyl ketone, and di-acetone alcohol.

6. (Original) The chip substrate according to claim 5, wherein the coating is performed by spin coating.

7. (Currently Amended) The chip substrate according to claim 5, which is selected from the group consisting of polymethyl methacrylic acid (PMMA), polycarbonate (PC) and cyclic olefin copolymers (COC).

8. (Original) The chip substrate according to claim 5, which has a slide shape.

9. (Withdrawn-Currently Amended) A method for preparing a biochip of claim 1 comprising (1) ~~integrating~~mounting a sol mixture containing said biomaterials in the shape of spots on a surface treated chip substrate; and (2) gelling the sol mixture in the shape of spots on the chip substrate.

10. (Withdrawn) The method according to claim 9, wherein the chip substrate as defined in claim 5 is used.

11. (Withdrawn) The method according to claim 10, wherein the sol mixture comprises at least one selected from the group consisting of silicate monomers, poly glyceryl silicate (PGS), 3-glycidoxypropyltrimethoxysilane (GPTMOS) and (N-triethoxysilylpropyl)-O-polyethylene oxide urethane (PEOU), as a basic component for the sol-gel matrix.

12. (Withdrawn) The method according to claim 11, wherein the silicate monomer is at least one 20 selected from the group consisting of tetramethyl orthosilicate (TMOS),

tetraethyl orthosilicate (TEOS), methyltrimethoxysillane (MTMS), ethyltriethoxysilane (ETEOS), trimethoxysilane (TMS), and 3-aminopropyltrimethoxysilicate (APTMOS).

13. (Withdrawn) The method according to claim 11, wherein the sol mixture further comprises at least one selected from the group consisting of glycerol, polyethylene glycol having a molecular weight of 400 to 8000, as the basic component for the sol-gel matrix.

14. (Withdrawn) The method according to claim 11 or 13, wherein the basic component for the sol-gel matrix is used in the range of 30 to 60 % by volume of the total sol mixture.

15. (Withdrawn) The method according to claim 11, wherein the silicate monomer used in the range of 10 to 40 % by volume of the total sol mixture.

16. (Withdrawn) The method according to claim 11 or 13, wherein poly glyceryl silicate (PGS), 3-glycidoxypropyltrimethoxysilane (GPTMOS), (N-triethoxysilylpropyl)-O-polyethylene oxide urethane (PEOU), glycerol and polyethylene glycol (PEG) are used in the range of 2 to 10 % by volume of the total sol mixture.

17. (Withdrawn) The method according to claim 16, wherein PGS is used in the range of 0.5 to 6 % by volume, GPTMOS is used in the range of 1 to 10 % by volume for,

PEOU is used in the range of 5 to 15 % by volume; glycerol is used in the range of 1 to 5 % by volume, or PEG is used in the range of 1 to 6 % by volume, based on the total sol mixture.

18. (Withdrawn) The method according to claim 11, wherein the polyglyceryl silicate (PGS) is a polymerization intermediate from the reaction of silicate monomer and glycerol.

19. (Withdrawn) The method according to claim 11, wherein the sol mixture further comprises a pH buffer.

20. (Withdrawn) The method according to claim 19, wherein the pH buffer is phosphate buffer.

21. (Withdrawn) The method according to claim 19, wherein the pH buffer has a pH range of 4 to 9.

22. (Withdrawn) The method according to claim 19, wherein the concentration of the pH buffer is in the range of 5 to 100mM.

23. (Withdrawn) The method according to claim 9, wherein the conditions for the gelation includes a temperature of 4 °C to 25 °C and a humidity of 40 to 80%.

24. (Withdrawn) A method for assaying a binding between a biomaterial immobilized on a biochip and a target material, comprising the steps of

applying a sample containing the target material to be assayed for binding with the biomaterial to the biochip as defined in claim 1 or the biochip prepared by the method as defined in claim 9; and

detecting the target material specifically bound to the bio material.

25. (Withdrawn) The method according to claim 24, wherein the reaction between the biomaterial and the target material occurs in the pores in the gel type spots wherein the biomaterial are entrapped in the pores and encapsulated by spot.

26. (New) The biochip of claim 1, wherein the biomaterials are selected from the group of consisting of DNA, RNA, PNA, proteins and oligopeptide.

27. (New) The biochip of claim 26, wherein the proteins include HIV p24, Combo, RgpIII, IgG-Cy3, antigens or antibodies for infectious disease diagnosis, antigens and antibodies for cancer diagnosis.

28. (New) The biochip of claim 1, wherein the chip substrate is selected from the group consisting of polymethyl methacrylic acid (PMMA), polycarbonate (PC) and cyclic olefin copolymers (COC).

29. (New) The biochip of claim 1, wherein the biomaterial is HIV p24.